

**LISTING OF CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Claims 1-21 (Canceled):**

**Claim 22 (Currently Amended):** A deficiency inspection method

based on a magnetic-particle inspection scheme, comprising the steps of:

irradiating an ultraviolet light on a surface of a specimen on which a magnetic particle is coated;

picking up an image of a solution containing fluorescent magnetic powder applied on a surface of a specimen by using a color video camera through a filter which filters the ultraviolet light;

detecting a deficiency candidate on said surface by using a green (G) signal component of said image acquired by said color video camera; and

displaying an image of said detected deficiency candidate on a screen; and  
storing the displayed image in a memory.

**Claim 23 (Currently Amended):** The deficiency inspection method

according to claim 22, wherein ~~in the step of detecting, a~~ the deficiency candidate on said surface is detected by using information of luminance of said green (G) signal component of said image.

**Claim 24 (Currently Amended):** A deficiency inspection method based on a magnetic-particle inspection scheme, comprising the steps of:

irradiating ultraviolet rays on a surface of a specimen to which a solution containing fluorescent magnetic powder is applied;

picking up an image of said ~~surface~~said surface irradiated with said ultraviolet rays by a color video-camera through a filter which filters said ultraviolet rays; and

displaying an image acquired by said color video-camera on a screen in nearly the same state as an image acquired by visually observing said surface irradiated with said ultraviolet rays.

**Claim 25 (Currently Amended):** A deficiency inspection method based on a magnetic-particle inspection scheme, comprising the steps of:

irradiating ultraviolet rays on a surface of a specimen to which a solution containing fluorescent magnetic powder is applied;

picking up an image of said surface irradiated with said ultraviolet rays by a color video-camera via an ultraviolet-rays cutting filter;

extracting ~~a deficiency and~~ deficiency candidates from an image acquired by said color video-camera; and

displaying on a screen images of ~~said~~the extracted ~~deficiency and~~ deficiency candidates.

**Claim 26 (Currently Amended):** A deficiency inspection method based on a penetrant inspection scheme, comprising the steps of:

picking up an image of a surface of a specimen by using a color video camera;

converting RGB data of the picked-up image to chromaticity and luminance;

and

detecting a deficiency candidate on said surface by using information ~~about~~of ~~said~~ chromaticity and luminance ~~obtained~~converted from said RGB data of the picked-up image picked up by said color video camera.

**Claim 27 (Currently Amended):** A deficiency inspection method

based on a penetrant-inspection scheme, comprising the steps of:

illuminating a surface of a specimen with polarized light;

picking up an image of said surface illuminated with said polarized light by a color video-camera via a polarization filter, wherein said color camera is calibrated by using camera calibration color chart for inspection;

extracting deficiency candidates from said image acquired by said color video camera; and

displaying images of said extracted deficiency candidates on a screen.

**Claim 28 (Currently Amended):** The A deficiency inspection method

for magnetic-particle-inspection or penetrant-inspection, comprising the steps of:

picking up an image of a surface of a specimen by a color video-camera with positional information of a visual field of said color video-camera which is calibrated by using camera calibration color chart for inspection;

detecting deficiency candidates in said surface by processing a color video signal of said image acquired by said color video camera;

displaying images of said detected deficiency candidates on a screen together with said positional information of said visual field; and

extracting true defect among said defect candidate by using information of feature characteristics.

**Claim 29 (Previously Presented):** The deficiency inspection method according to claim 28, wherein said positional information of said visual field is originated from a scale arranged in said visual field.

**Claim 30 (Currently Amended):** The deficiency inspection method according to any one of claims 22-29, wherein said image of said surface is picked up by said color video camera over plural visual fields.

**Claim 31 (Currently Amended):** A deficiency inspection method for magnetic-particle-inspection or penetrant inspection, comprising the steps of:

illuminating a specimen with light;

taking an image of a surface of athe specimen by a camera through a filter which filters the light reflected from said surface by the illumination;

detecting deficiency candidates in said surface from said image taken by said camera;

displaying images of said extracted deficiency candidates on a screen; and

distinguishing a pseudo deficiency among said images of said extracted  
deficiency candidates displayed on said screen.

**Claim 32 (Currently Amended):** A deficiency inspection method  
comprising the steps of:

picking up an image of a surface of a specimen by image pickup means;  
detecting deficiency candidates ~~in~~on said surface among said image acquired  
by said image pickup means;  
displaying images of said detected deficiency candidates on a screen; and  
storing said ~~displayed image~~images of said detected deficiency candidates  
with information of feature characteristics of said deficiency ~~candidate~~candidates in a  
memory.

**Claim 33 (Currently Amended):** A deficiency inspection apparatus for  
magnetic-particle-inspection or penetrant inspection, comprising:

illumination means for illuminating a surface of a specimen on which a  
magnetic particle is coated;  
image pickup means for picking up an image of said surface by a color video  
camera through a filter;  
deficiency-candidate detecting means for detecting deficiency candidates ~~and~~  
~~their features in shape from~~ a green (G) signal component of said image picked up  
by said image pickup means; and  
display means for displaying images of said deficiency candidates detected by  
said deficiency-candidate detecting means.

**Claim 34 (Previously Presented):** The deficiency inspection apparatus according to claim 33, wherein said illumination means has an ultraviolet-rays illuminating section for illuminating ultraviolet rays onto said surface of said specimen, and a white-light illuminating section for illuminating white light onto said surface of said specimen.

**Claim 35 (Currently Amended):** A deficiency inspection apparatus, comprising:

illumination means for illuminating a surface of a specimen;

image pickup means for picking up an image of said surface by a color video camera, which is calibrated by using camera calibration color chart for inspection;

magnetic-particle-inspection-originated deficiency-candidate extraction means for extracting magnetic-particle-inspection originated deficiency candidates in said surface from said image of said surface picked up by said image pickup means;

penetrant-inspection-originated deficiency-candidate extraction means for extracting penetrant-inspection-originated deficiency candidates in said surface from said image of said surface picked up by said image pickup means; and

display means for displaying images of said deficiency candidates detected by said magnetic-particle-inspection-originated deficiency-candidate extraction means or said penetrant-inspection-originated deficiency-candidate extraction means.

**Claim 36 (Currently Amended):** A deficiency inspection apparatus for magnetic-particle-inspection or penetrant inspection, comprising:

an illuminator which illuminates a surface of a specimen;

a camera which picks up an image of said surface;

a deficiency-candidate detector which detects deficiency candidates on said surface from said image of said surface picked up by said camera by using a green (G) signal component of said image;

a storage section which stores images of said deficiency candidates detected by said deficiency-candidate detector; and

a display unit which displays information of said images of said deficiency candidates stored in said storage section on a screen.

**Claim 37 (Currently Amended):** A deficiency inspection apparatus, comprising:

ultraviolet-rays irradiation means for irradiating ultraviolet rays ~~to~~onto a surface of a specimen to which a solution containing fluorescent magnetic powder is applied;

image pickup means for picking up an image of said surface irradiated with said ultraviolet rays by a color video-camera through a filter which filters said ultraviolet rays; and

display means for displaying said image of said surface picked up by said image pickup means on a screen in nearly the same state as an image acquired by said visual observation.

**Claim 38 (Currently Amended):** A deficiency inspection apparatus based on a probing scheme, comprising:

~~ultraviolet-rays irradiation~~illuminating means for irradiating ~~ultraviolet rays~~  
~~to~~illuminating light on a surface of a specimen to which a solution containing  
~~fluorescent magnetic powder~~ penetrant inspection treatment is applied;

image pickup means for picking up an image of said surface  
~~irradiated~~illuminated with said ~~ultraviolet rays~~light by a color video camera via an  
~~ultraviolet-rays cutting filter, which is calibrated by using camera calibration color~~  
chart for inspection;

converter means for converting RGB data of the image picked-up by said  
image pickup means to chromaticity and luminance;

deficiency-candidate detecting means for detecting deficiency candidates and  
~~features thereof based on shape from~~ by using information of said chromaticity and  
luminance of said image of said ~~surface picked up by said image pickup means~~; and

display means for displaying images of said deficiency candidates detected by  
said deficiency-candidate detecting means.

**Claim 39 (Currently Amended):** A deficiency inspection apparatus,  
comprising:

~~ultraviolet-rays irradiation~~illuminating means for irradiating ~~ultraviolet rays~~  
~~to~~illuminating light on a surface of a specimen to which a solution containing  
~~fluorescent magnetic powder~~ penetrant-inspection treatment is applied;

image pickup means for picking up a ~~fluorescent~~ an image of said surface  
~~irradiated by said ultraviolet rays emanated from said ultraviolet-rays~~  
~~irradiation~~illuminated by said illuminating means by a color ~~video~~ camera;



converter means for converting RGB data of the image picked-up by said image pickup means to chromaticity and luminance;

deficiency-candidate detecting means for detecting deficiency candidates on said surface ~~using information of luminance of a green (G) signal component in a color image signal output from~~ from said image picked-up by said color camera of said image pickup means; and

display means for displaying images of said deficiency candidates detected by said deficiency-candidate detecting means; and

memory means for storing displayed images with data of chromaticity and luminance obtained by said converter means.

**Claim 40 (Currently Amended):** A deficiency inspection apparatus, comprising:

illumination means for illuminating a surface of a specimen to which a penetrant is temporarily applied with white light;

image pickup means for picking up an image of said surface by a color video camera which is calibrated by using camera calibration color chart for inspection camera;

magnetic-particle-inspection-originated deficiency-candidate detecting means for detecting magnetic-particle-inspection originated deficiency candidates on said surface from a green (G) signal component of said image of said surface picked up by said image pickup means;

penetrant-inspection-originated deficiency-candidate detecting means for detecting penetrant-inspection-originated deficiency candidates on said surface from said image picked up by said image pickup means; and

display means for displaying images of said deficiency candidates detected by said magnetic-particle-inspection-originated deficiency-candidate detecting means or said penetrant-inspection-originated deficiency-candidate detecting means.

**Claim 41 (Currently Amended):** The deficiency inspection apparatus according to any one of claims 33 to 40, ~~wherein~~further comprising positional information display means arranged in a visual field of said color camera, for displaying positional information of a~~said~~ visual field of said color ~~video~~ camera is arranged in said visual field.

**Claim 42 (Previously Presented):** The deficiency inspection apparatus according to claim 40, wherein said positional information display means is a scale.